Promenade to enhanced aesthetics: Gingival recession coverage in combination of modified coronally advanced tunnel technique with T-PRF, A case report

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Abstract

A dentist's top priority is aesthetics, and one of the primary interest in aesthetic dentistry is recession coverage. A unique therapy option for a variety of mucogingival abnormalities with variable results is platelet rich fibrin membrane. Due to rising cosmetic demand, treating gingival recession has become a significant therapeutic issue. There have been several surgical procedures designed to achieve consistent cosmetic root coverage. In more detail, the purpose of periodontal regeneration surgery is to complete wound healing and periodontal unit regeneration Recent advancements in dentistry include the preparation and use of a concentrated solution of the growth factors found in platelets is termed platelet-rich fibrin (PRF). These growth factors contribute to Postulated as promoters of tissue regeneration and wound healing.

Keywords: Esthetics, Gingival recession, Modified coronally advanced technique.

INTRODUCTION

There was a time when a misconception was prevailed to a known fact that aesthetic dentistry is all about to bring the teeth in proper alignment but now the time has changed with the evolving advancements in the field of dentistry.

The main purpose for doing periodontal plastic and soft tissue reconstructive surgery is for cosmetic reasons. Periodontists, who make up the majority of the dental team, are responsible for understanding the best aesthetics, treatment indications, and patient communication.

Modern dentistry ensures that today's operations are carried out with the least amount of pain and the greatest amount of safety.1

The humdrum of gingival recession is the revelation in the field of periodontology. Gingival recession (GR) is defined as the exposure of the root surface due to the displacement of the gingival margin apical to the cementoenamel junction (CEJ). The exposed root surfaces are frequently associated with aesthetic complaints, root hypersensitivity and difficulties to achieve optimal plaque control. Exposure of the root surfaces is typically linked to aesthetic grievances, underlying sensitivity, and overcoming obstacles to attain ideal plaque control.2 Dental plaque, a high frenum pull, a root prominence area, a thin, narrow band of gingiva, and postsurgical gingival recessions are some of the contributing variables for gingival recession which could be preceded by root hypersensitivity, aesthetic concerns, and abrasion, each of which might be harmful to fundamental dental health. But it's still difficult to anticipate the results of certain surgeries.

Modified coronally advanced technique (MCAT) has been recently proposed to approach for isolated gingival recession. With the following benefits, MCAT has been advocated for the surgical treatment of gingival recession: (a) It avoids vertical releasing incisions and does not incise the papillae.

(b) The soft tissue graft is completely covered as a result of the flap's coronal displacement, which optimizes graft survival.3

For the regeneration of lost tissues, platelets concentrates are way ahead of other growth biomaterials due to constant release of growth factors which are crucial for stimulation of adjacent progenitor cells, leading to periodontal regeneration and tissue healing.

PRF has been evaluated recently for root coverage procedures and its an aggregate of platelet concentrate geared to simplify regenerative procedures. PRF in general simulates the microcirculatory system and release growth factors thatbare essential for soft tissue healing and also serves as a resorbable membrane offering satisfactory and favourable results with low risk.

Whitman et al4 in 1997 were the first to introduce the use of platelet rich plasma in oral surgical procedure reporting its great advantages as it enhances osteoprogenitor cells, however using it also presented risk because bovine thrombin, which is used to handle PRP may generate antibodies to factor 5, 11 and may lead to coagulopathies that may endanger life. PRF second generation platelet concentrate was first used on 2001 by choukron et al5 specifically in oral and maxillofacial surgery and is considered as a new generation of platelet concentrate consisting of matrix of autologous fibrin and has several advantages over PRP including easier preparation and not requiring any chemical manipulation of blood which makes it strictly an autologous preparation.

Titanium advanced PRF T-PRF recently developed by Tunali et al6 that avoids any negative effects caused by dry glass or glass coated plastic tubes and plays an important and promising role in increasing soft tissue augmentation due to its fibrin structure which is tighter than that of L-PRF prepared in grade 4 titanium test tubes, providing faster epithelization, and better wound healing.

Tunali et al introduced Titanium prepared PRF. Titanium is passivated into an oxide layer within itself, which activates platelets and forms a thicker fibrin clot. In addition to above benefits T-PRF also has longer resorption time. Histological studies by Tunali et al and Chatterjee et al7 revealed that T-PRF had thicker fibrin meshwork and higher cellular entrapment, causing more cellularity at the required site and leading to periodontal regeneration.

Thus, the aim of the current case report was to evaluate the treatment of Miller's Class I Gingival Recession defect of human maxillary and anterior teeth by using MCAT along with autologous T-PRF.

Material and Method:

A 30year old male patient with isolated recession defect presented with a chief complaint of compromised esthetics and dentinal hypersensitivity to the Outpatient Department (OPD) of Periodontology, Subharti Dental College and Hospital, Meerut. There was no documented medical history or any past relevant dental history. On intraoral clinical examination Class 1 gingival recession was present in #13 with acceptable oral hygiene was noted. The patient duly signed the informed written consent form after carefully reviewing the treatment plan, risks, and benefits. The recordings were performed at baseline, one month and three months. The Clinical parameters such as Probing pocket depth with Recession length and width (in mm) was measured using UNC-15 periodontal probe. Initially, Phase I therapy was carried out. All the pre-operative photographs were documented in mm. (Fig: 1-4)

Fig: 1 Pre-Operative View Fig: 2 Pre-Operative Recession length measured

Fig: 3 Width of attached gingiva measured nvncsacahcsj measured Fig:4 Recession width measured nvncsacahcsj measured

PRF preparation: - T-PRF clots were prepared 20 minutes before surgery based on Tunali et al (3500rpm for 15 min) 10ml blood was drawn from antecubital vein and was then transferred into sterile medical-grade 5ml titanium tubes and sterile glass tubes, respectively. (Fig: 5 and 6)

Fig:5 Centrifuge Machine Fig:6 Titanium test tubes for preparing T-PRF

Surgical phase: Light-cure composite with primer application was used to place two coronal composite plugs for sutures in the area bridging the teeth. Extraoral and intraoral mouth disinfection was carried out with 2% Betadine, followed by infiltration of local anaesthesia, (2% Articaine with 1:80,000 epinephrine). The MCAT design was started with an intrasulcular incision on the recession site using Blade No. 15 (Fig:7) and split-thickness flap was raised and tunnel preparation was completed with the help of microsurgical tunnelling knives leaving the interdental papilla intact. (Fig:8) Mucoperiosteal tunnel preparation was extended by full-thickness elevation apically from the mucogingival junction utilizing tunnelling knives. To achieve complete mobilization of the flap, interdental papillae were gently undermined using microsurgical elevators. Special attention was paid to not disrupt the interdental papillary tissue. T-PRF membrane was placed into the prepared tunnel (Fig:9-10) The flaps were positioned coronally to the CEJ through vertical and horizontal mattress sutures (5-0 PGPLA sutures) placed above the contact point after thorough root planing of recession site. (Fig:11)

Fig:7 Crevicular incision given

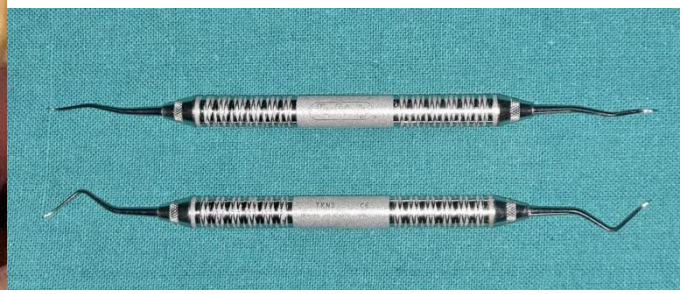

Fig:8 Tunneling knives

Fig:9 Tunnel prepared with the tunneling instrument

Fig10: T-PRF Prepared

Fig:10 Procured T-PRF placed into the recession defect

Fig: 11 Sutures placed

Postoperatively, 5 days of antibiotics (Amoxicillin 500mg + Clavulanic acid 125mg 8 hourly for 5days) and analgesics (Tab Diclofenac 50mg+ Paracetamol325mg+, serratiopeptidase 15mg 8 hourly for 5 days), were prescribed. The patient was directed to rinse three times per day with 0.12% Chlorhexidine gluconate and was advised not to brush the surgical site for the first two weeks. After 15 days, the patient was summoned back for suture removal, and was then routinely monitored for three months. (Fig:12,13)

Fig:12 One month follow up

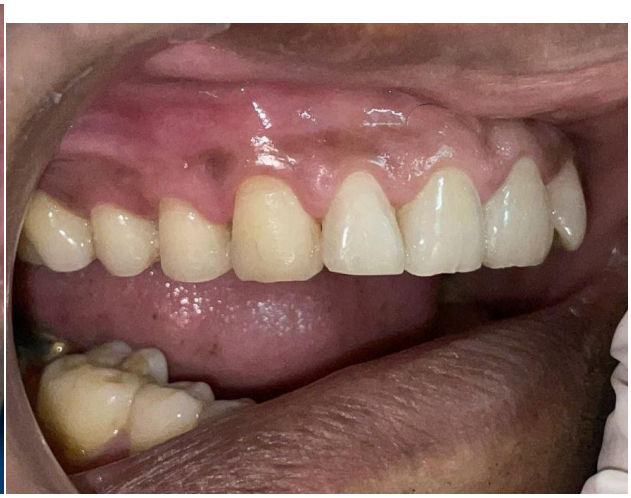

Fig:13 Three months follow up

RESULTS:

The results showed that the MCAT approach demonstrated predictable root coverage. Considered to be a better treatment choice with good aesthetics and patient satisfaction for isolated gingival recession. With precise flap elevation, this approach also enhances access to and visibility of the treated spot.

Discussion: The clinician faces a dilemma when dealing with predictable coverage and isolated gingival recession, and there is very little information available in the literature on this topic. Most of the techniques of coronally advanced flap technique utilized coronal displacement of flap through periosteal incisions, to eliminate the muscle tension on the flap. In the present modified technique, coronal displacement was allowed through elimination of muscle insertions as reported by de Sanctis and Zucchelli.8

This method achieved better and more consistent root coverage while simultaneously decreasing the tension on the flap and allowing passive flap displacement to the CEJ without sutures due to the lack of muscle pull. The most notable result of the current investigation was a definite trend toward increased gingival thickness.9

The proliferation of gingival and periodontal ligament fibroblasts under the impact of growth factors from PRF or a spacing effect of the PRF membrane may be responsible for the rise in GT. The benefit of adding PRF appears to be a large increase in the thickness of gingiva, which may improve the outcome of the current study for the treatment of single tooth gingival recessions by MCAT.10

PRF membrane is an easy-to-procure, economical, autologous healing biomaterial and, when used along with the MCAT technique, appears to improve biotype and successfully treat multiple GR defects.11

CONCLUSION

This case report reflects the success of MCAT technique in along with autologous biomaterial for coverage of isolated recession defects and its ability to increase the thickness of the keratinized gingival tissue, and effective for the treatment of denuded root surfaces. However additional studies with a large sample size and long term follow up should validate the preliminary finding presented here.

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